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PROVISIONAL PATENT APPLICATION UNDER §111(b)	*Attorney Docket No.*	025330-9001-00
	First Named Inventor	
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Mail Stop PROVISIONAL PATENT APPLICATION
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P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Enclosed for filing is a complete provisional patent application entitled "SYSTEM FOR BONDED COMPOSITE DENTISTRY" invented by:

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and including the following documents:

Specification - 17 pages
Drawings - 13 sheets
Return Receipt Postcard
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SYSTEM FOR BONDED COMPOSITE DENTISTRY

Field of the Invention

This invention relates generally to bridge framework, and more particularly to bridge framework for use in producing tooth-replacement bridges or splinting unstable teeth.

Background of the Invention

A dental bridge is an artificial prosthesis typically used to replace at least one missing tooth between natural teeth. The bridge includes a pontic which fills the edentulous space and a connecting framework to attach the pontic to the natural teeth for support. In addition, a dental bridge may also be used to splint one or more unstable teeth to stabilize the teeth.

In conventional practice, a dental bridge is cast from an intraoral impression of the teeth to be restored and the surrounding tissue. Casting a dental bridge involves a time consuming and complex procedure which involves time spent by a laboratory in preparing the dental bridge and time spent by the patient and oral surgeon or dentist in installing the dental bridge.

Constructing a bridge from a prefabricated pontic and/or connector assembly offers the advantage of speed, simplicity and substantial cost savings over the cast bridge. However, such conventional prefabricated assemblies may not be capable of sustaining biting forces in the mouth.

An exemplary conventional connector assembly includes a ZEZA Bar. The ZEZA Bar is configured as a miniature I-beam made of titanium having multiple circular perforations therethrough. The ZEZA Bar may be configured to support one or more pontics and/or unstable teeth. During installation of the ZEZA Bar, unpolymerized composite resin is allowed to flow

through the perforations to strengthen the bond between the ZEZA Bar and the resin, and subsequently, the bond between the ZEZA Bar and the natural tooth or teeth anchoring the ZEZA Bar.

Currently, the ZEZA Bar is only available in one length, has limited perforation (which translates to a limited bonding potential), and does not have provisions for occlusal stops. In addition, the ZEZA Bar does not have the ability to support a long span of teeth or for pontic construction and other attachments (e.g., arch wires, etc.).

Another exemplary conventional connector assembly includes the MONODONT® fixed bridge component system (the "Monodont System") manufactured by the East Flex Corporation. The Monodont system utilizes a metal substructure or bridge ("Monodont") to support a pontic in an edentulous space between two natural teeth. The Monodont generally includes a central portion for supporting a pontic and opposing end portions or wings configured to engage the natural teeth for support. Either of the central portion or the wings may be bent to conform to a specific contour or height.

The Monodont System, however, is problematic for several reasons. For example, the metal substructure of the Monodont is bendable, and repeated flexure of the metal substructure (by biting action, etc.) may lead to fracture of the polymerized composite pontic and bonding resin securing the pontic to the Monodont. Another problem with the Monodont System, for example, is that the Monodont utilizes a non-perforated substructure. As a result, the bond created by the resin between the pontic and the Monodont may be insufficient in light of the twisting, torquing, and/or occlusal wear of the pontic, which may lead to eventual de-bonding of the composite.

Yet another problem with the Monodont System, for example, is that the wings or metal extensions engaging the natural teeth are not long enough and are also non-perforated. It is the experience of some in the industry that unless the wings extend almost or all the way through the abutment tooth or into two or more teeth, the occlusal twisting and torquing forces of chewing and grinding may de-bond the embedded metal wings and cause the entire appliance to fail. A further problem with the Monodont System, for example, is that the Monodont does not have occlusal stops to slow and/or halt occlusal wear to both the pontic and the bonded composite over the sandblasted metal Monodont.

Another problem with the Monodont System, for example, is that the Monodont may not have sufficient strength to support multiple pontics. The additional occlusal twisting and torquing forces of chewing and grinding on more than one pontic applies additional stress on the natural teeth supporting the one or more pontics. In addition, another problem with the Monodont System, for example, is that the Monodont can not continuously go through a quadrant of teeth (e.g., 4-5 teeth) or through a half arch or a full arch of teeth. Yet another problem with the Monodont System, for example, is that the Monodont/pontic composite is only lab fabricated, and it is not able to be made by a dentist sitting chair side.

Summary of the Invention

The present invention provides, in one aspect, an adjustable system for bonded composites including a ladder supporting a truss in one of multiple relative positions therewith. The ladder includes opposing rails connected by a plurality of rungs. The plurality of rungs are spaced along the rails to define a plurality of openings between adjacent rungs. The truss includes a metal strip having a plurality of upstanding projections. The projections are

correspondingly spaced with the openings defined in the ladder to allow the truss to engage the ladder in a plurality of relative configurations. The combination of the ladder and truss also provides a torsionally rigid and substantially stiff assembly with which to support one or more pontics and/or unstable teeth.

The present invention provides, in another aspect, a system for bonded composites including a reinforced metal substructure for supporting a pontic. The reinforced metal substructure is substantially webbed, or includes a plurality of apertures or perforations therethrough to allow the flow or seepage of resin through and around the metal substructure for increased bonding strength of the resin between the pontic and the metal substructure. The metal substructure also includes reinforcing structure or framework in a direction along the ladder and truss, to which the metal substructure is coupled, and in a direction substantially normal to the ladder and truss.

The present invention provides, in yet another aspect, a system for bonded composites including the ladder and truss structure having a sufficient length to extend substantially through one or more teeth and a plurality of apertures or perforations therein to allow the flow or seepage of resin through and around the ladder and truss for increased bonding strength of the resin between the supporting one or more teeth and the ladder and truss.

The present invention provides, in a further aspect, a system for bonded composites including provisions for occlusal stops. One or more projections on the truss may be configured to extend sufficiently far through the ladder such that the one or more projections serve to slow or halt the occlusal wear of the pontic.

The present invention provides, in another aspect, a system for bonded composites including a bendable ladder structure configured to go through a quadrant of teeth, a half-arch of

teeth, or a full arch of teeth. The ladder structure may also be configured with an anterior segment for full or partial arch splinting. The anterior segment may include a single rail connecting ladder structures at opposite ends thereof, in addition to a plurality of apertures or perforations therethrough to allow the flow or seepage of resin through and around the ladder and truss for increased bonding strength of the resin between the supporting one or more teeth and the anterior segment. In addition, the bendable ladder structure may support a relatively long span of teeth or other attachments (e.g., arch wires).

The present invention provides, in yet another aspect, a system for bonded composites including a ladder and truss structure adaptable by the dentist and/or oral surgeon while sitting chair side with their patients. The adjustability built into the ladder and truss structure allows the dentist and/or oral surgeon to make adjustments to the composite without having to send it off-site to a laboratory.

Other features and aspects of the present invention will become apparent to those skilled in the art upon review of the following detailed description and drawings.

Brief Description of the Drawings

In the drawings, wherein like reference numerals indicate like parts:

FIG. 1 is a perspective view of a ladder structure.

FIG. 1A is a perspective view of a ladder structure with anterior perforated segment for full arch splinting.

FIG. 1B is a perspective view of the ladder structure with the anterior perforated segment.

FIG. 2 is a perspective view of a truss structure that is engageable with the ladder structure of FIGS. 1-1B.

FIG. 3 is a perspective view of the truss structure of FIG. 2 with an attached substructure for supporting a pontic.

FIG. 4 is a perspective view of a combination of the ladder structure, truss structure, and substructure for supporting a pontic.

FIG. 4A is a perspective view of the combination of FIG. 4 in preparation for bonding to prepared teeth.

FIG. 4B is a perspective view of two pontics supported by the ladder and truss structure relative to a single abutment tooth.

FIG. 5 is a perspective view of a ladder structure with an anterior segment, illustrating a substructure for supporting a pontic supported by the ladder structure.

FIG. 5A is an enlarged perspective view of the anterior segment of FIG. 5, illustrating detail of the connection between the anterior segment and the ladder structure.

FIG. 6 is a perspective view of a combination ladder structure, truss structure, and substructure for supporting a pontic, illustrating an anterior arch wire connected to the ladder structure.

FIG. 6A is an enlarged perspective view of the combination of FIG. 6, illustrating the connection between the anterior arch wire and the ladder structure.

FIG. 7 is a perspective view of a metal shield for supporting an anterior pontic.

FIG. 8 is a perspective view of a temporary or permanent bridge abutment lingual finger metal reinforcement.

FIG. 9 illustrates multiple views of an insert for use in individual single composite restorations.

Before any features of the invention are explained in detail, it is to be understood that the invention is not limited in its application to the details of construction and the arrangements of components set forth in the following description or illustrated in the drawings. The invention is capable of other embodiments and of being practiced or of being carried out in various ways. Also, it is to be understood that the phraseology and terminology used herein is for the purpose of description and should not be regarded as limited.

Detailed Description

As shown in FIG. 1, a ladder structure, or ladder 10, includes opposing rails 14 connected by a plurality of rungs 18. The rails 14 each include a plurality of apertures or perforations 22 therethrough. The rails 14 are configured such that they are separable from one another so a segment comprising a singular rail 14 may be formed, if desired, as part of the overall framework of the ladder 10. The plurality of rungs 18 are spaced along the rails 14 to define a plurality of openings 26 between adjacent rungs 18. The configuration of the ladder 10 provides the ladder 10 with an increased torsional rigidity and stiffness not found in conventional bridge framework and/or connecting assemblies.

The ladder 10, by itself, can be used to splint mobile teeth, among other applications. The ladder 10 may be pressed into unpolymerized light cured composite resin that is placed in MO, DO, or MOD preparation. The ladder 10 may also splint up to six teeth that are in a straight line (e.g., posterior teeth), in addition to splinting all of the anterior teeth by severing one rail 14 of the ladder 10 and bending an anterior portion 30 of the ladder 10, or by severing one rail 14 of the ladder 10 and removing that rail 14 and its corresponding rungs 18 to leave remaining just one rail 14 of the ladder 10, which may have a plurality of apertures or perforations 22

incorporated therein (see FIGS. 1A and 1B). In addition, the bendable ladder 10 may support a relatively long span of teeth or other attachments (e.g., arch wires 34).

With reference to FIG. 2, a truss structure, or truss 38, is shown. The truss 38 includes a metal strip 42 having a plurality of upstanding metal projections 46. The projections 46 are correspondingly spaced with the openings 26 defined in the ladder 10 to allow the truss 38 to engage the ladder 10 in a plurality of relative configurations to yield a bridge. One or more apertures 54 may also be formed through the metal strip 42 in a location between the projections 46. The combination of the ladder 10 and truss 38 also provides a torsionally rigid and substantially stiff bridge with which to support one or more pontics 58 and/or unstable teeth.

The projections 46 may be arranged on the metal strip 42 to engage every other or every third or every fourth rung 18 in the ladder 10. As a result, the truss 38 may fit precisely between the two rails 14, and the projections 46 may fit precisely between every other, every third, or every fourth rung 18 in the ladder 10 to interlock the truss 38 and ladder 10. In addition, the projections 46 may act as occlusal stops by ending 1-1.5 mm above the height of the top portion of the rails 14 and rungs 18. The truss 38, after interlocking with the ladder 10, reinforces and/or bridges the openings 26 or open span between the rungs 18 on the ladder 10. As shown in FIGS. 6 and 6A, the truss 38 may be configured with an integral arch wire 34. FIG. 6A illustrates the connection of the truss 38 having the arch wire 34 to the ladder 10. Alternatively, the truss of FIG. 2 may also be configured with the connecting structure of the truss 38 of FIG. 6A.

With reference to FIG. 3, a reinforced metal substructure 62 is shown coupled to the truss 38 for supporting a pontic 58. The metal substructure 62 is substantially webbed, and includes a plurality of apertures or perforations 66 therethrough to allow the flow or seepage of resin through and around the metal substructure 62 for increased bonding strength of the resin between

the pontic 58 and the metal substructure 62. The apertures or perforations 66 through the metal substructure 62 provide an increased surface area for which the resin to bond. The metal substructure 62 also includes reinforcing structure or framework in a direction along the truss 38 and in a direction substantially normal to the truss 38. A pontic 58 formed around the metal substructure 62 may have an increased torsional rigidity as a result of the resin bonding with the metal substructure 62.

Two or more pontics 58 (arranged side by side or otherwise) may be used in this system because of the reinforcing nature of the truss 38 interlocking with the ladder 10, which increases the compressive strength and resistance to torquing of the pontic 58 provided by the metal substructure 62. The strength of the ladder 10 and truss 38 may also be increased by splinting as many teeth as possible to stabilize the pontic 58. In other words, the more abutments incorporated on either side of the pontic 58, the stronger the bridge.

In an exemplary application in which two bicuspids are missing, the bridge could be fabricated by splinting three molars together in the posterior, or two, three, or more teeth in the anterior (e.g., cuspid, lateral, etc.) around the anterior arch if necessary. For the anterior portion of the mouth, if a tooth is missing, an anterior pontic could be fabricated out of composite and attached to a metal shield 70 that has metal projections 74 (see FIG. 7) to engage the perforated ladder 10.

FIG. 9 illustrates an insert 82 for use in individual single composite restorations. The insert includes multiple apertures 86, 90 to allow resin to flow through and around the insert 82 in creating the composite restoration.

The present invention also includes a system for making and installing a temporary bridge, in which the dentist makes the temporary bridge chair side. The dentist first selects the

appropriate length of the ladder 10 and then snaps in a section of the truss 38 with one, two, three, or more pontics 58 depending on how many teeth are missing. The dentist can then select a lingual finger metal reinforcement 78 that slides into the side apertures or perforations 22 in the rails 14. These finger reinforcements 78 sit lingual to the prepared teeth (e.g., molar, bicuspid, cuspid, lateral, and central) and the dentist sets a small amount of unpolymerized light-cured composite on the occlusal surface of the prepared teeth.

The dentist then places the ladder 10, truss 38, and one or more pontics 58 into the unpolymerized light-cured composite. The dentist then partially light-cures the resin without bonding the resin to the tooth. The dentist then takes a vacuum-formed clear stent and fills it with acrylic or composite, then sets it over the ladder 10 and truss 38 on the prepared teeth, so that when the temporary bridge is removed, the ladder 10, truss 38, and pontic(s) 58 are picked up because they are internally incorporated in the temporary bridge. The metal projections 46 on the truss 38 act as occlusal stops to prevent the wearing of the bridge. This makes the temporary bridge both reinforced and slow to wear occlusally, which therefore makes the temporary bridge a long-term temporary bridge.

In conventional dental bridges, the laboratory fashions the temporary bridge in a different manner. After receiving the study models and bite from the dentist, the laboratory prepares the designated teeth for crown preps. The laboratory then selects the appropriate length and pontic size for the bridge and appropriate lingual reinforcement systems. The laboratory then constructs the metal reinforced temporary bridge for placement by the dentist into the patient's mouth.

The system of the present invention eliminates any casting to be done, since the individual components (e.g., the ladder 10, truss 38, metal substructure 62, etc.) can be a part of an extensive kit available to the dentist. For the reinforced single, double, or more pontic bridge,

all the dentist has to do is send the laboratory a set of unprepared study models, a bite, and a shade. The laboratory can groove the MO, DO, MOD preps in the adjacent teeth and fabricate a trim coping for the dentist to follow. The laboratory can then fabricate the bridge. When the dentist receives the bridge, the dentist only needs to put the trim coping in the patient's mouth, groove the teeth, apply the bonding resin, put the composite into the grooves, press the ladder 10 and truss 38 into the composite, tamp it over, light-cure the ladder 10 and truss 38 into the composite, and finally adjust the occlusion.

The ladder 10 and truss 38 of the present invention can be used in a variety of different applications. In one exemplary application, the ladder 10 and truss 38 can be used to stabilize mobile teeth up to and including an entire arch using just the ladder 10, or the ladder 10 in combination with the truss 38 or the truss 38 with the metal substructure 62 for anchoring the pontic 58. This is accomplished by embedding the ladder 10 and truss 38 into MO, DO, or MOD preparations in the teeth to be stabilized, in which unpolymerized composite resin has been placed. After seating the ladder 10 and truss 38, the resin oozes through the apertures or perforations 22 in the ladder 10 and the apertures 54 in the truss 38. After the resin is sufficiently set, it is tamped down and molded. The composite resin is then light cured or polymerized to create a permanent reinforced bridge.

In another exemplary application, the interlocking ladder 10 and truss 38 with metal substructure(s) 62 and pontic(s) 58 can be used to replace a missing tooth or teeth at any location over the arch. An artificial tooth or teeth can be formed around the metal substructure 62 by the dentist chair-side either free-hand or with celluloid pontic halves made from composite resin (light-cured or light-polymerized). The artificial tooth or teeth can also be fabricated in a dental laboratory by a dental laboratory technician. The resulting bridge is then bonded in two or more

teeth after preparation of those teeth by the dentist and inserting the ladder 10 and truss 38 as previously discussed.

In yet another exemplary application, the interlocking ladder 10 and truss 38 with or without metal substructure(s) 62 or pontic(s) 58 may be used by a dentist or laboratory technician to construct a metal reinforced temporary bridge with metal occlusal stops. This eliminates the conventional use of custom metal castings. The ladder 10 and truss 38 with or without metal substructure(s) 62 or pontic(s) 58 are incorporated chair-side by the dentist using acrylic or composite resin in conjunction with a vacuum-formed clear celluloid bridge form, or by the laboratory using heat processed acrylic.

In another exemplary application, the ladder 10 and truss 38 as designed without the metal substructure(s) 62 or pontic(s) 58 can also be cast as one piece. The castings can be made from titanium, dental hard-gold alloy, crown and bridge non-precious metal, stainless steel, or cast ceramic such as Empress, among other materials. The castings can fit within an MO, DO, or MOD restoration to act as a reinforcement, contact point or former, occlusal and marginal ridge stops for the MO, DO, or MOD light-cured composite restoration into which they are embedded to enhance the strength, longevity and durability of a light-cured or light-polymerized resin restoration. The castings can also be used to reinforce a single temporary crown as previously discussed. The ladder 10 and truss 38 can provide a long lasting temporary crown, which is substantially resistant to occlusal wear.

In yet another exemplary application, the ladder 10 and truss 38, with or without metal substructure(s) 62 or pontic(s) 58, may also be used by a laboratory to fabricate an all-composite (such as BELLE GLASS) permanent bridges. After the dentist supplies an impression of conventionally prepared teeth, the laboratory can incorporate the ladder 10 and truss 38 with

pontic(s) 58 into a composite bridge to reinforce spans of missing teeth. The ladder 10 and truss 38 with pontic(s) 58 can substantially resist torquing and provide occlusal stops and mesial and distal marginal ridge stops. Additionally, all of the previously-discussed applications may all be accomplished at the same time in the same arch.

The ladder 10 and truss 38 of the present invention may provide several advantages over conventional dental bridge structures. The ladder 10 and truss 38may be configured to:

1. Stabilize mobile teeth

2. Replace missing tooth or teeth with ease

3. Reinforce temporary bridges and single temporary crowns

4. Reinforce permanent composite bridges and single composite crowns

5. Reinforce single tooth composite restorations

6. Eliminate custom castings for all of the above by providing pre-cast, pre-engineered cast interlocking or individually cast pieces

7. Reduce the amount of tooth structure needed to be removed to secure or fasten a permanent composite bridge

8. Reduce the amount of time, effort, and money spent by the dentist, laboratory technician, and patient to accomplish the purposes enumerated

9. Provide a system with multiple applications that will be available in a chair-side kit for both the dentist and the laboratory technician

10. Provide a more versatile and adaptable system to deal with various dental problems and conditions compared to conventional dental bridge structure already on the market

11. Provide increased strength over conventional, currently available systems

12. Resist compressive loads, torquing, and occlusal wear

The ladder 10 and truss 38 of the present invention differs from currently available dental bridge structures (e.g., the ZEZA Bar and the Monodont System) in the following ways:

1. The ladder 10 and truss 38 can include more surface area that is available for bonding (i.e., because of the ladder design with round rungs and increased number of apertures or perforations compared to the ZEZA Bar)

2. The ladder 10 and truss 38 can be bent to go around the whole arch to stabilize the whole arch

3. The ladder 10 and truss 38 can provide stronger pontic spans and longer spans

4. The ladder 10 and truss 38 can be used to support one or more pontics

5. The ladder 10 and truss 38 can be used for temporary bridge reinforcement and single temporary crown reinforcement

6. The ladder 10 can be reinforced by the truss 38

7. The truss 38 can include integral occlusal stops

8. The ladder 10 and truss 38 can be used for reinforcement of composite bridges and single crowns over conventional preps with occlusal stops

9. The ladder 10 and truss 38 can be used by the dentist chair-side

10. The ladder 10 and truss 38 can be used by the laboratory technician

11. The ladder 10 and truss 38 can eliminate custom castings by the laboratory for temporary or permanent bridges

12. The ladder 10 and truss 38 in combination with celluloid pontic forms can enable the dentist to fabricate pontic or pontics chair-side and enable the laboratory technician to fabricate pontic or pontics in the laboratory

13. The ladder 10 and truss 38 can have arch wire attachment for anteriors

14. The ladder 10 and truss 38 can have perforated band attachment for anteriors

15. The ladder 10 and truss 38 can have lingual finger reinforcements 78 for temporary or permanent bridge abutments

16. The ladder 10 and truss 38 can have separate anterior pontic or pontics to attach to anterior perforated bar

17. The ladder 10 and truss 38 can provide in a single casting form of titanium, gold alloy, non-precious or cast ceramic a well locked and bonded reinforcement for an MO, DO, MOD restoration that provides internal strength, occlusal stops, mesial or distal contact points or forms, mesial and/or distal marginal ridge stops in a material much stronger than the light-cured composite in which it's imbedded. The same also applies to a single temporary crown

18. Individual rails of the ladder 10 can be severed and separated by dentist or laboratory technician by cutting through the rungs with a diamond disc or JO-DANDY disc

19. The ladder 10 and truss 38 can be sandblasted with 50 micron aluminum oxide powder and then coated with BISCO primer B before bonding

20. The width of the ladder 10 and truss 38 can be altered depending on whether it is going to be used on a molar or bicuspid.

The system components can be catalogued in the following manner:

1. Ladder:

Length – short, medium, long and extra long length

Width – narrow, medium, wide and extra wide

Double ladder with full arch – small, medium, large and extra large arch wire

Double ladder full arch – small, medium, large and extra-large perforated side rails or non-perforated side rails

2. Truss:

Metal strip, or top member of truss – can be with or without occlusal metal projections

Length – short, medium, wide and extra-wide

Truss with pontic:

Perforated top member – all the way through or only perforated over abutment teeth

Posterior Pontics (Top member as stated before)

Single – molar – small, medium, large and extra large

Double - molar – small, medium, large and extra large

Single Bicuspids - molar – small, medium, large and extra large

Double Bicuspid - molar – small, medium, large and extra large

Molar & Bicuspid - molar – small, medium, large and extra large

Molar & 2 Bicuspids - molar – small, medium, large and extra large

Clear celluloid Pontic forms

3. Celluloid forms: 2 halves of which form a pontic or pontics which are fabricated over the metal substructure

4. Anterior pontic (shields): single double, triple up to six (6) anteriors

5. Posterior half or full metal cages, for temporary bridges, or processed composite bridges over prepared teeth:

Molars – all sides

Bicuspids – all sides

Cuspids - all sides

Laterals – all sides

Centrals – all sides

6. Individually-cast ladder and truss structure for single composite restorations. Titanium, gold, non-precious, or ceramic materials may be used. Different width and lengths could differ by 0.5 mm or smaller. Plus plastic analogs are supplied in to match.

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(1) Basic Ladder (1)

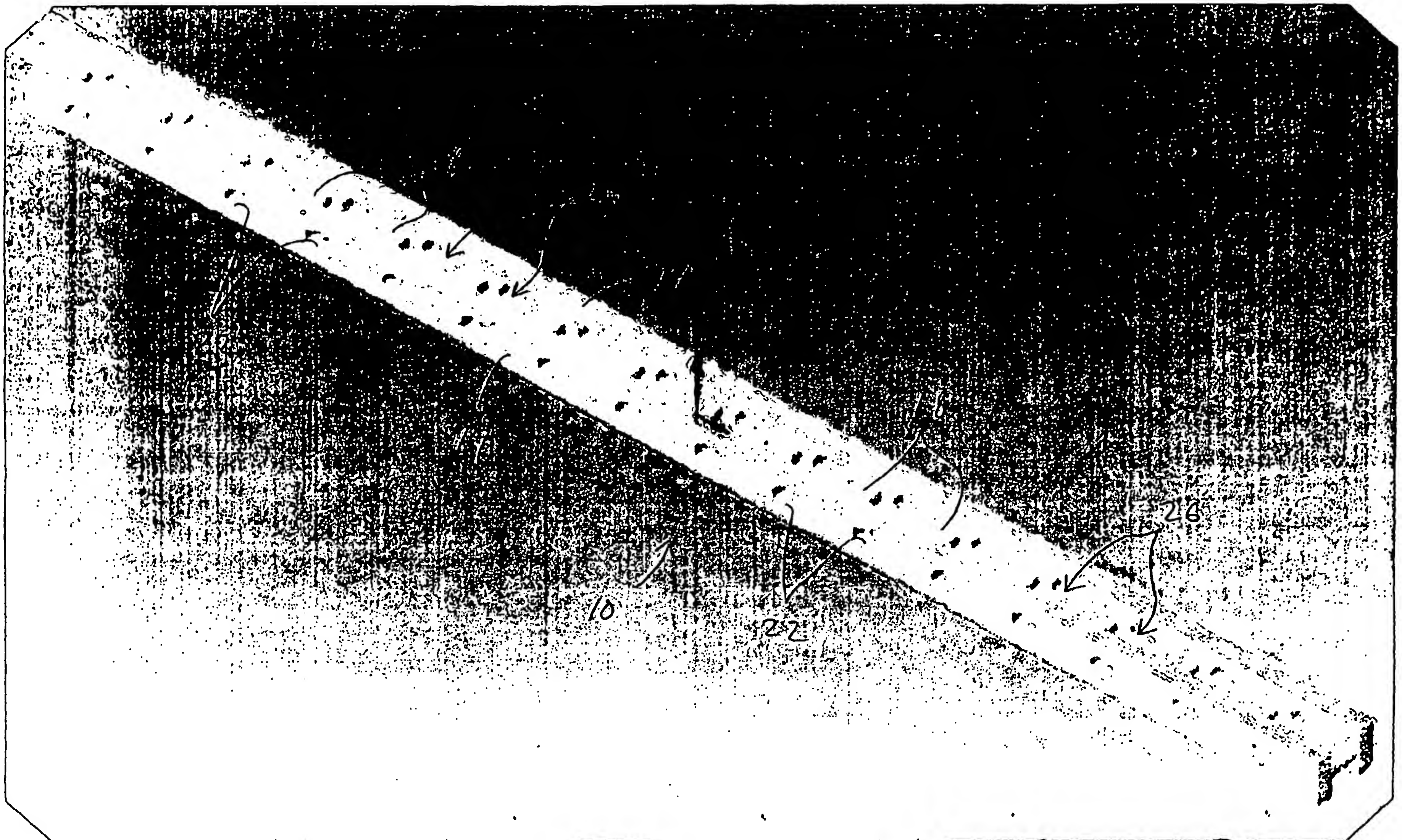
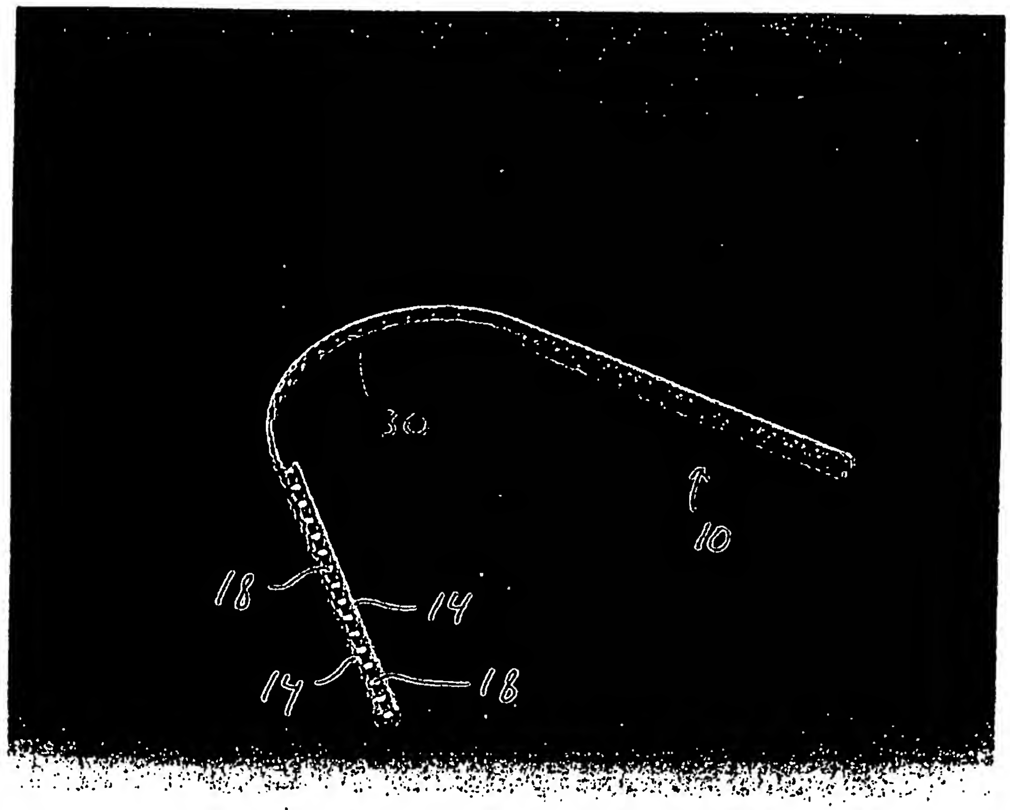


Fig. 1

Frank E. Delmonico

1A

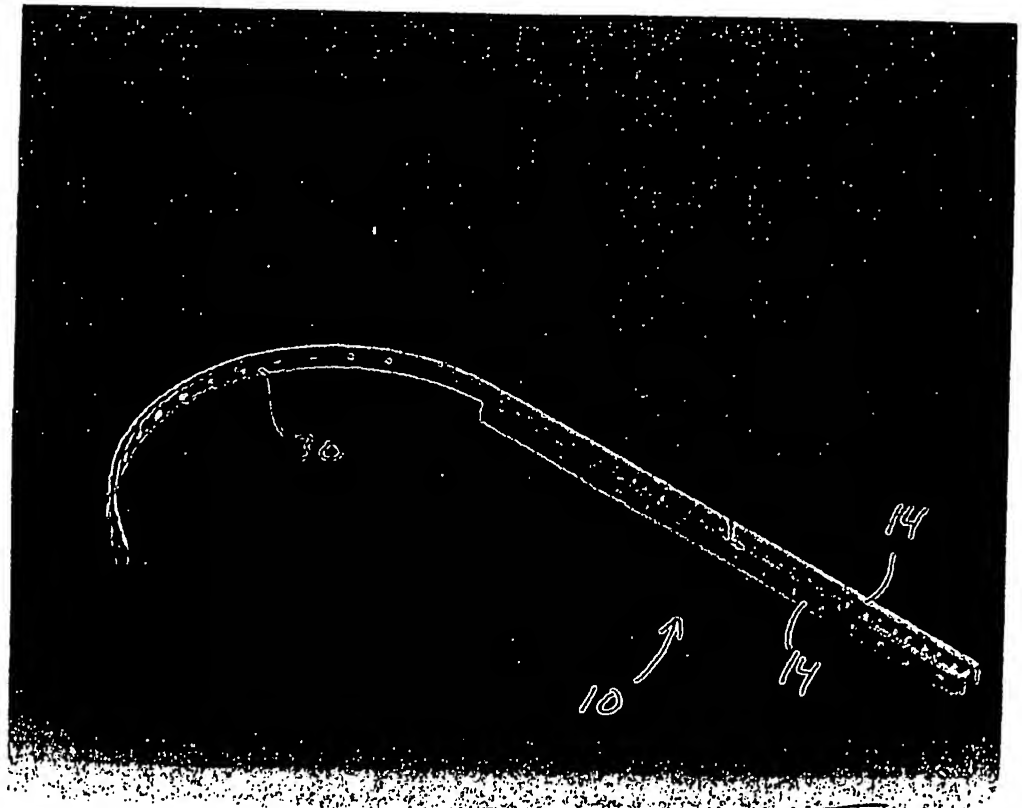


Basic ladder w/ anterior segment for full arch splinting

Frank E. [illegible]

Fig. 1 A

1B



Basic Catheter w. anterior perforated segment

Frank E. Delmonico

Fig. 1B

(2)
II
truss
without
pointer

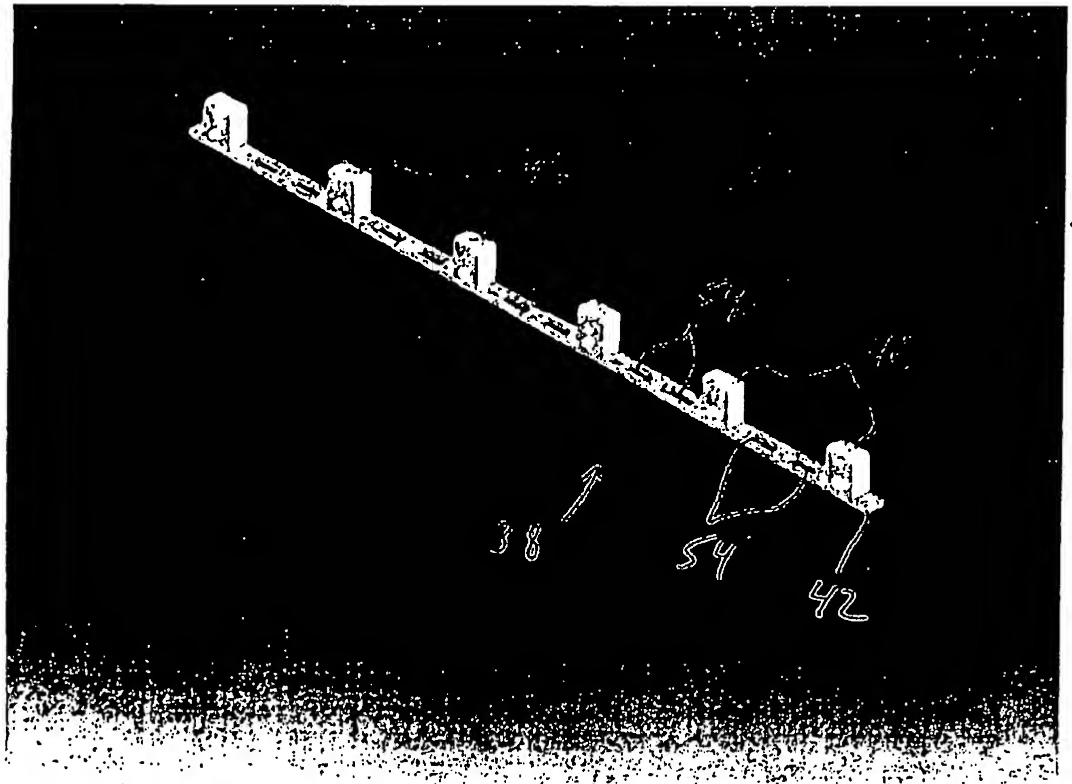


Fig. 2

III
(3)
truss
with
pointer

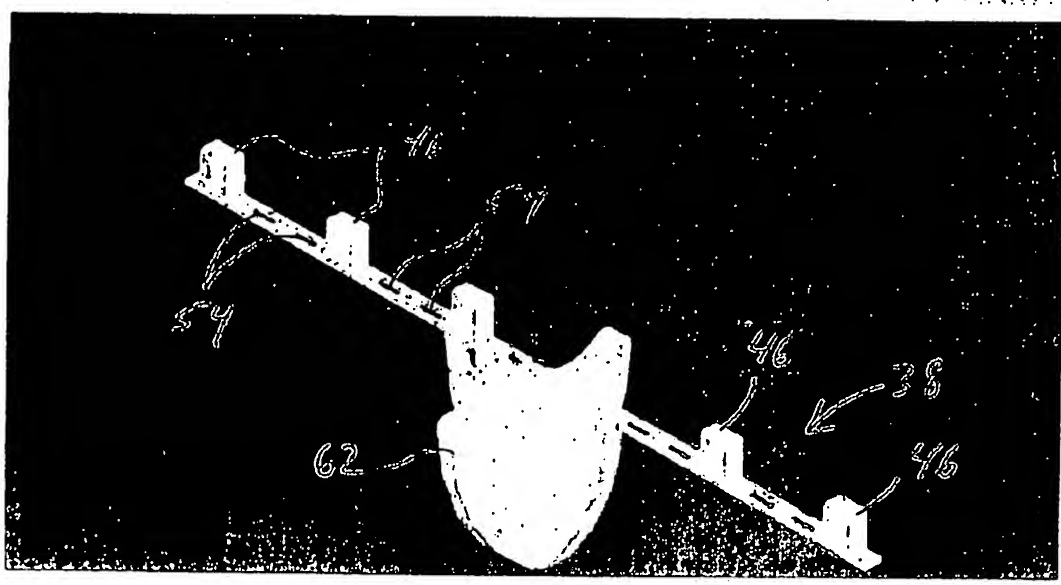
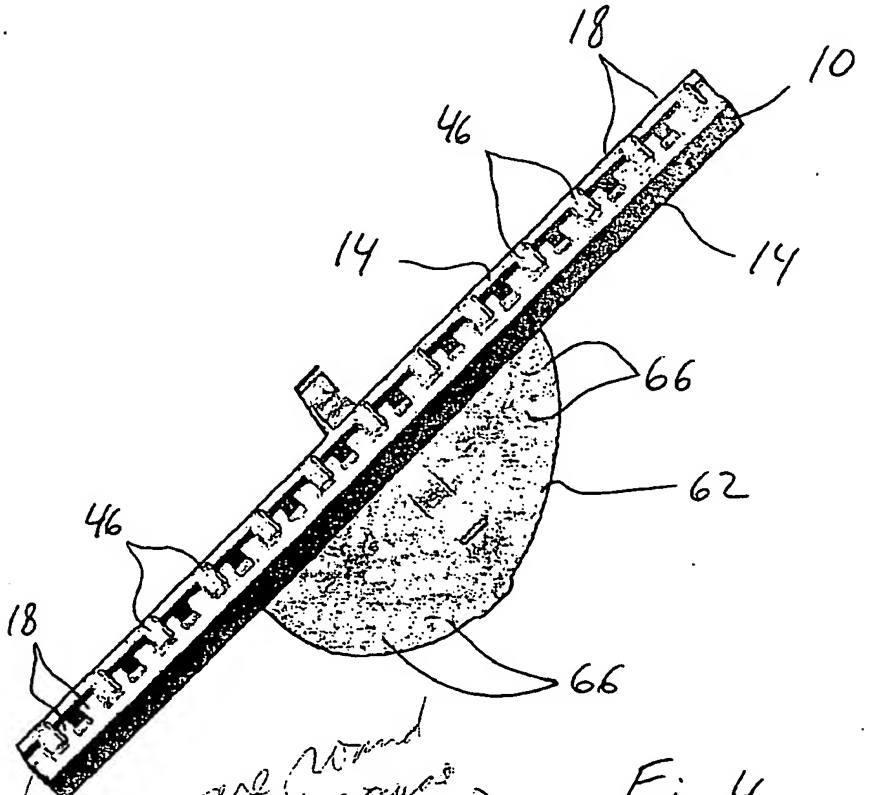


Fig. 3

(4) Combination of 1+3
Ladder, Truss + Portic



(Hinges are round not square (could be square)

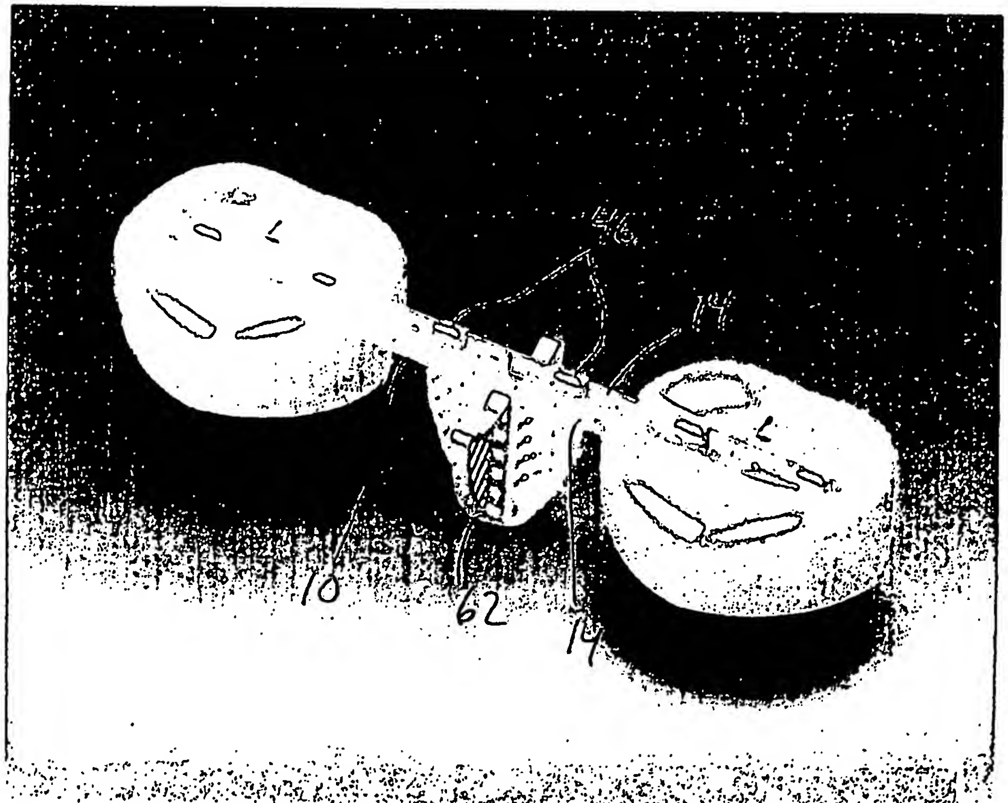
Fig. 4

Frank E. Delmonico

4 A

Best Picture

Frank E. Delmonico DDS



Combination of 1 + 3 in teeth Ladder + TRUSS + Pontic system showing how it gets bonded into teeth (prepared)

Fig. 4A

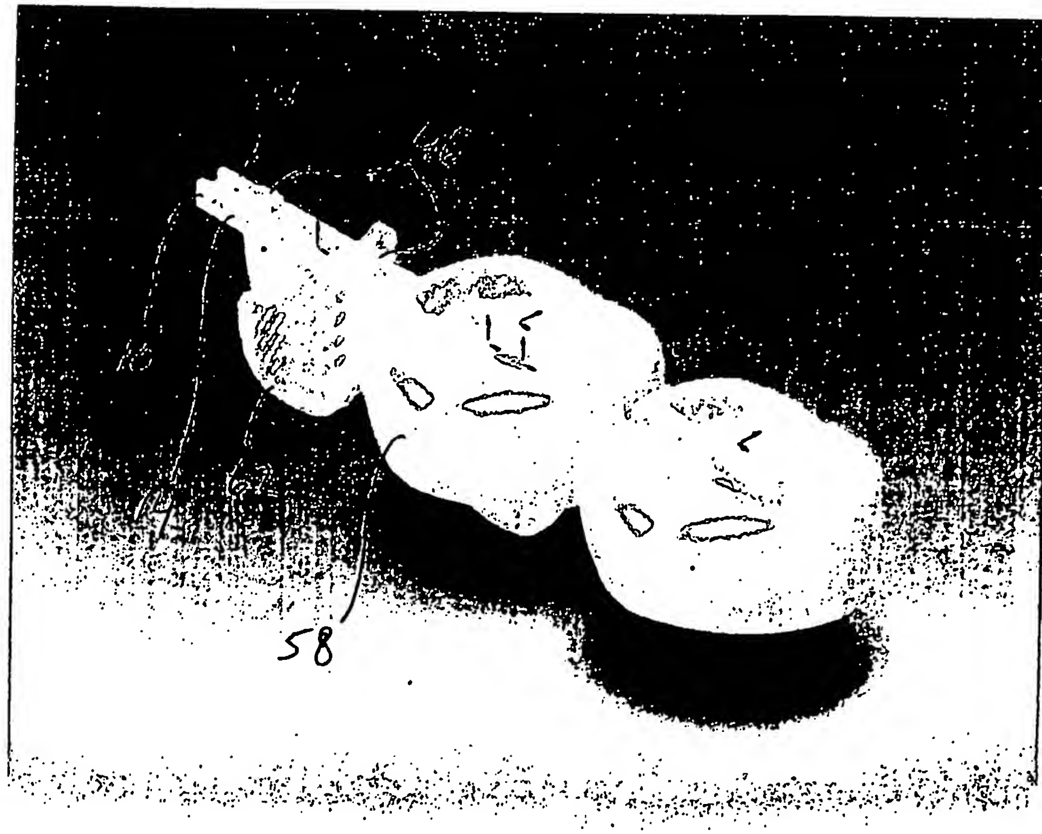


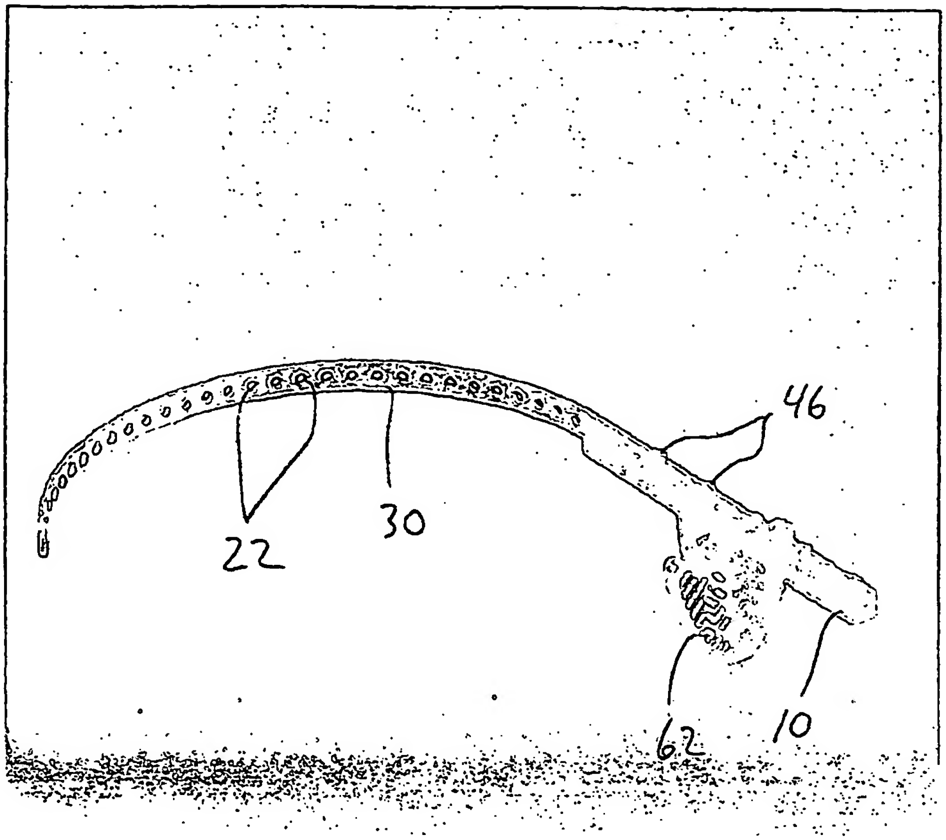
Figure
4 B
IV B

Two posts
pontics
(one not coated in composite + the other partially covered by composite)

Frank E. Delmonaco DDS

Fis. 4B

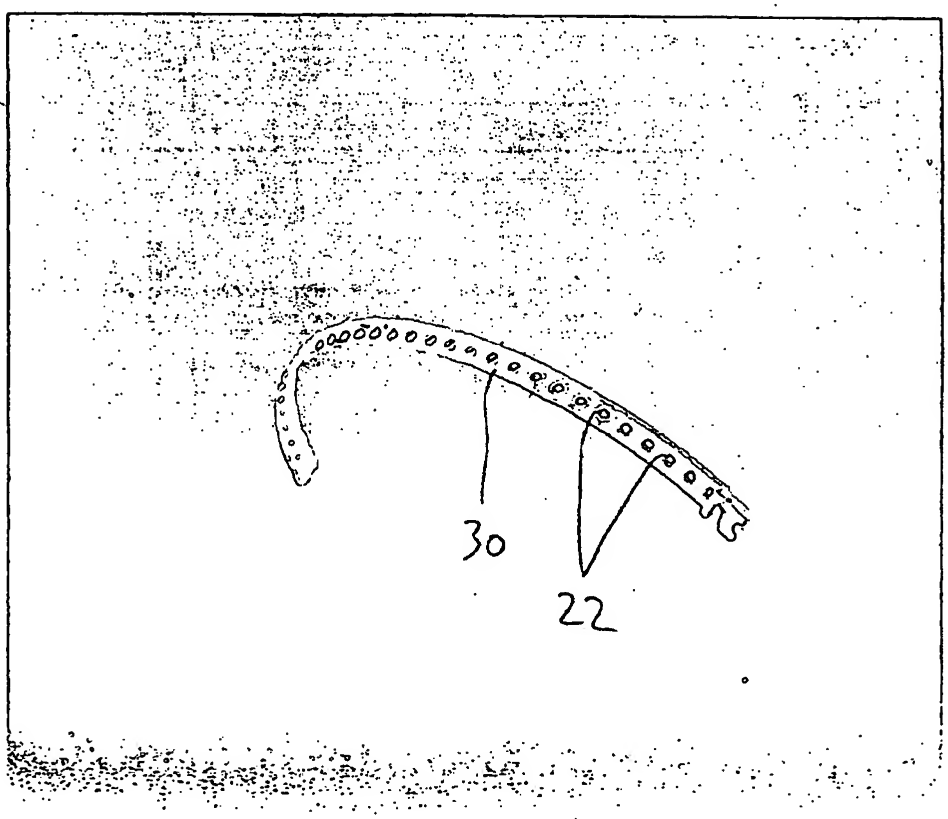
5
I



Ladder + truss + pointer w. anterior addition

Fig. 5

II A
- A



anterior separate addition + detail of connection

Fig. 5A

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6 Ladder + Truss + pontic with anterior arch wire

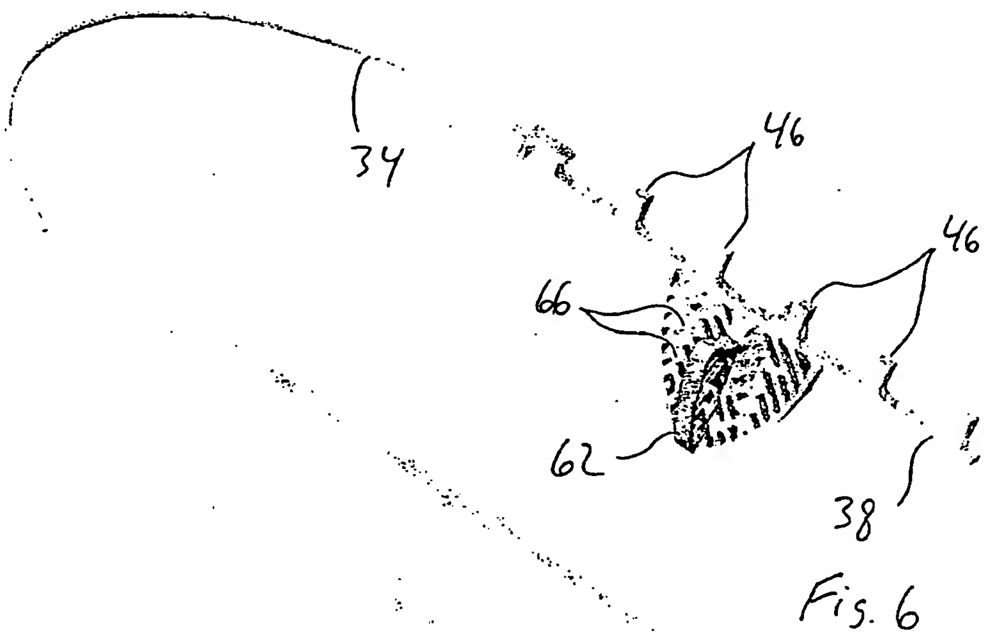

Fig. 6

(6A) Detail of ant. arch wire connector

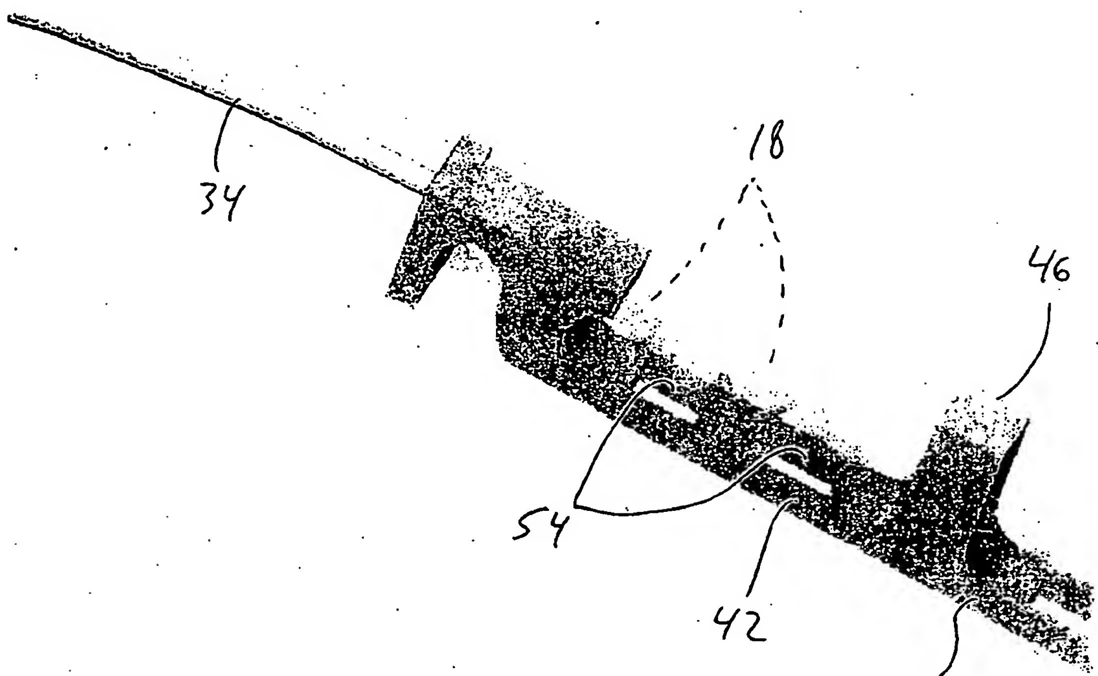

Fig. 6A

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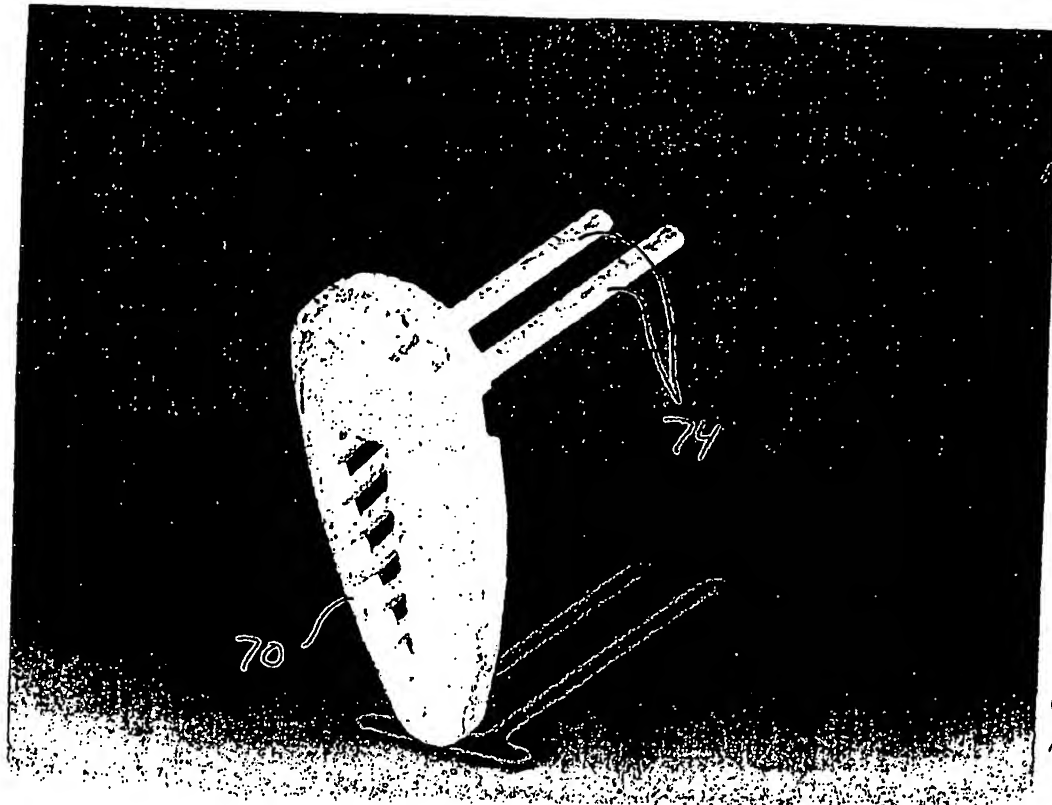
7



antenna
pointer
addition

Frank Ei
D. Dinwoodie
FB

Fig. 7

8

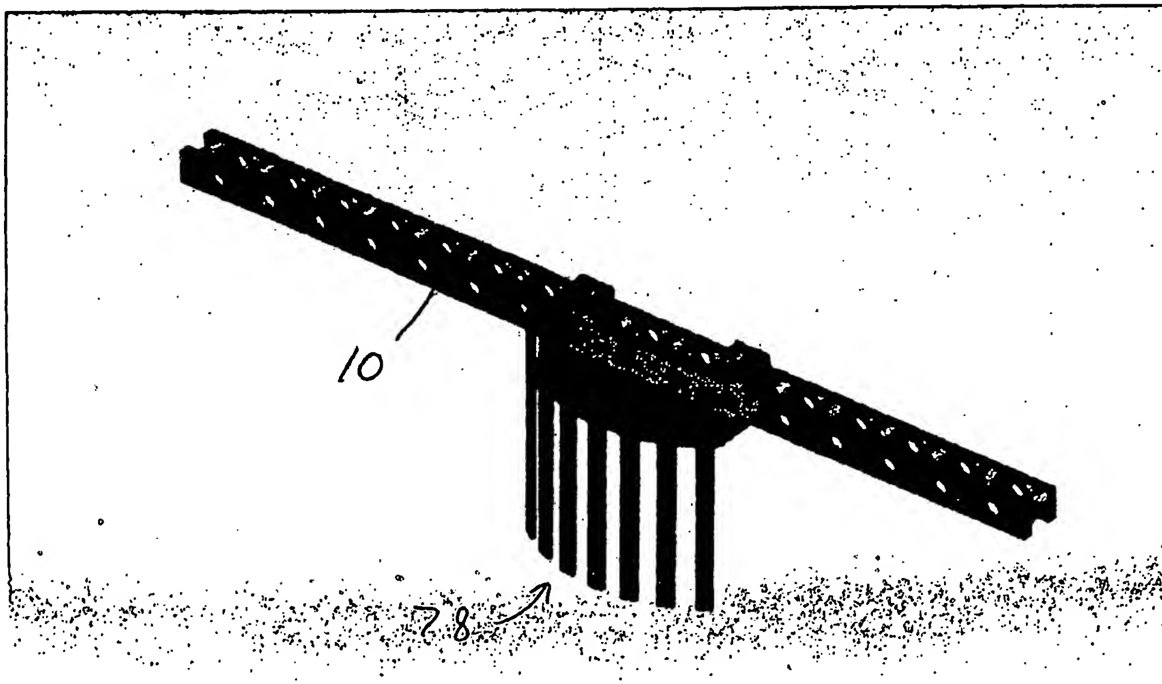


Fig. 8

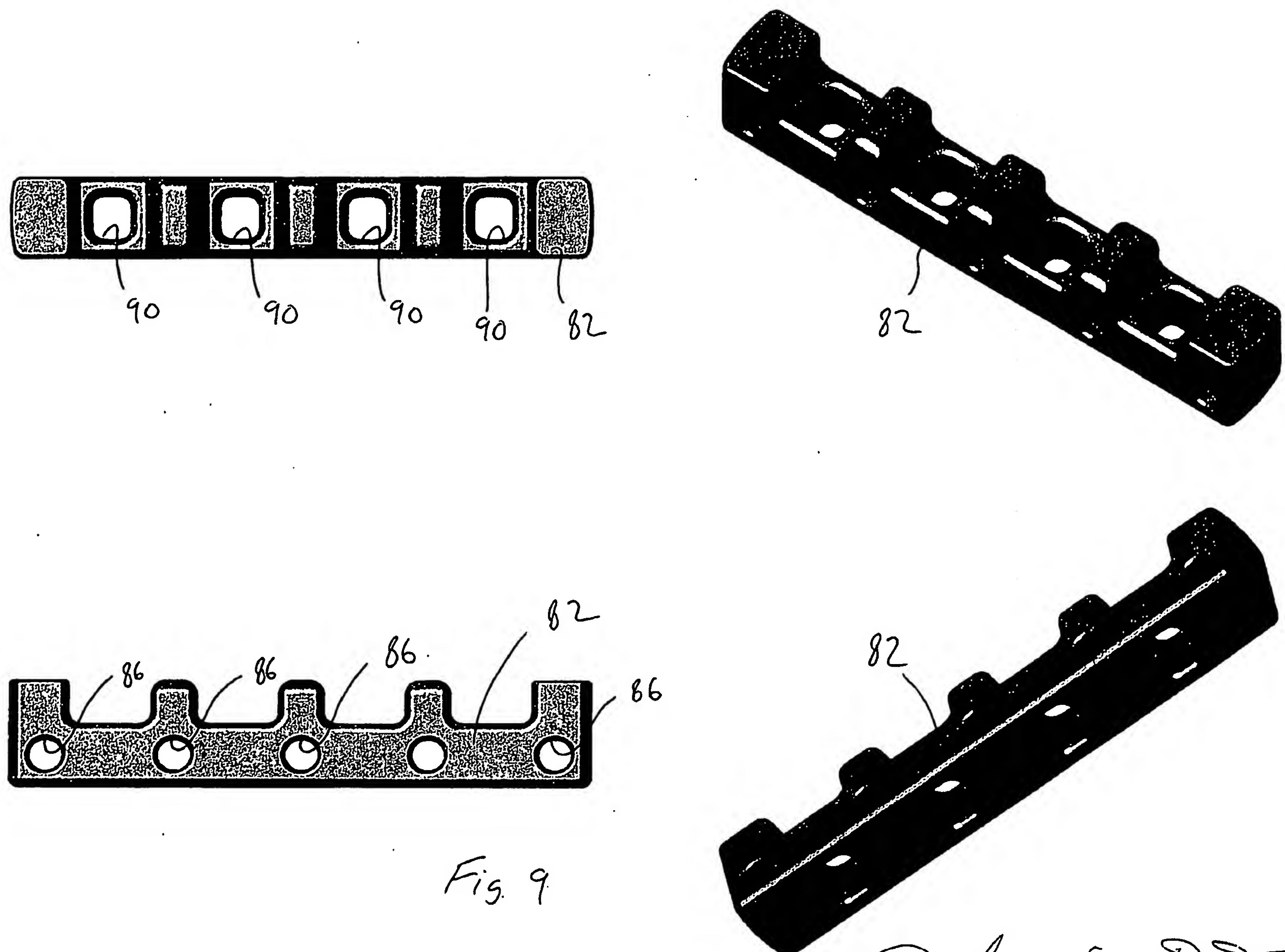


Fig. 9

Frank E. Delmonico, DDS

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